

## ABSTRACT

A multi-panel phased array antenna architecture and signal processing subsystem combines baseband outputs of multiple carrier demodulators associated with respective phased array panels prior to bit-decision processing at  
5 baseband for data and clock recovery. The baseband bit decisions are fed back to control the operation of the carrier recovery loops of the demodulators. This improves the signal-to-noise ratio in the carrier recovery loops and allows near theoretical system operation at lower  
10 signal-to-noise ratios than would otherwise be achievable.